

## **REMARKS**

Claims 1-27, all the claims pending in the application, stand rejected for being indefinite, for being directed to non-statutory subject matter and on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion. The following paragraphs are numbered for ease of future reference.

### **I. The 35 U.S.C. §112, Second Paragraph, Rejection**

[0001] Claims 1-27 stand rejected under 35 U.S.C. §112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action provides as follows:

Claims 1, 8, 15 and 21 recite sequential steps of (1) a first rescheduling to move purchase order receipts to an earlier time period, (2) solving core production planning system equations, and (3) a second rescheduling to move purchase order receipts to a later time period. It is not clear what is being done in the second step of solving core production planning systems equations and how this step is different from the first rescheduling (to earlier times) or the second rescheduling (to later times). The purpose of solving production planning equations (e.g. linear programming) is to reschedule items planned for production to earlier or later times to achieve the optimal production plan (e.g. to minimize earliness or lateness of delivery to maximize customer satisfaction while minimizing costs). With this purpose in mind, it is not clear how the step of solving production planning equations is separate and distinct from the steps of rescheduling to earlier and later time periods. It is the examiner's position that the claimed invention involves optimizing the scheduled timing of items to be produced within a desired window having an earliest and latest possible time. Clarification is required.

[0002] In the present invention (e.g., see paragraphs [0134]-[0136]), a first rescheduling process is performed, which comprises rescheduling the purchase order receipts so as to indicate that they will be received by the plant at earlier dates than initially specified. Then, these

rescheduled purchase orders and, more particularly, the rescheduled purchase orders associated with the earlier dates are used to solve the core production planning equations. Thus, the core production planning equations are solved assuming that all purchase order receipts are received earlier rather than later (e.g., at the very beginning of the production planning horizon, during the earliest time periods allowable by a supplier). This allows the invention to efficiently allocate different resources and different planning requirements within the production planning system. Once the core production planning equations are solved, a second rescheduling process is performed, which comprises rescheduling the purchase order receipts but this time doing so as to indicate that they will be received by the plant at later dates (e.g., during the latest time periods allowable by said supplier). Thus, the rescheduling processes refer to two different processes in which the time periods within which purchase order receipts will be received by a plant rescheduled. This is different from the process of actually solving the core production planning equations to allocate resources. Independent claims 1, 8, 15 and 21 are amended herein to better clarify what the two rescheduling processes entail in order to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these rejections.

## **II. The 35 U.S.C. §101 Rejection**

[0003] Claims 1-20 stand rejected under 35 U.S.C. §101 because the Office Action asserts that the claimed invention is directed to non-statutory subject matter. These rejections are traversed as explained below.

[0004] Regarding the rejection of claims 1-20 under 35 U.S.C§101, the Federal Circuit Court of Appeals in *In re Bilski*, \_\_\_ F.3d \_\_\_ (Fed. Cir. 2008)(*en banc*) recently held that to be statutory a process must be either tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. As amended, independent claims 1, 8 and 15 include method steps that are tied to a machine, in this case a computer. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these rejections.

### **III. The Prior Art Rejections**

[0005] Claims 1-4, 7-9, 13, 16, 20-22, and 26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wang, “Earliness/Tardiness Production Planning Approaches with Due-Window for Manufacturing Systems”, Computers Ind. Engng, Vol. 34, No. 4, pp. 825-836, 1998, hereinafter referred to as Wang. Claims 5-6, 10-12, 14-15, 17-19, 23-25 and 27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wang in view of Lilly (U.S. Patent No. 6,088,626), hereinafter referred to as Lilly. Applicants respectfully traverse these rejections based on the following discussion.

#### **A. Rejection Of Claims 1-4, 7-9, 13, 16, 20-22, And 26 Based On Wang**

[0006] The Applicants submit that the prior art reference does not teach or suggest the following limitations of amended independent claim 1 (or the similar limitations of amended independent claims 8 and 21): (1) “performing, by said computer, a first rescheduling process ~~so~~ ~~that~~ comprising rescheduling when said purchase order receipts are to be received by a plant so

as to indicate that said purchase order receipts will be received by said plant during earlier time periods than initially specified”; (2) “after said performing of said first rescheduling process, solving core production planning system equations using rescheduled purchase order receipts associated with said earlier time periods from said first rescheduling process”; and (3) “after said solving, performing, by said computer, a second rescheduling process comprising rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during later time periods than specified during said first rescheduling process.”

[0007] More particularly, in rejecting independent claim 1 (and similarly in rejecting independent claims 8, 15, and 21) the Office Action provides as follows:

“performing a first rescheduling process so that said purchase order receipts are rescheduled to be received by a plant during earlier time periods than initially specified (see page 825, "Introduction", para. 3, disclosing rescheduling to produce earlier than a due date; page 826, sections 2.1 and 2.1.1, disclosing the earliest starting time and delivery time required by an order; page 834, equation 29 and associated text, disclosing the earliest starting time of products; figure 1)”;

“after said performing of said first rescheduling process, solving core production planning system equations using rescheduled purchase order receipts from said first rescheduling process (see at least equations 26-30; see Wang generally, disclosing linear programming)”;

and

“after said solving, performing a second rescheduling process so that said rescheduled purchase order receipts from said first rescheduling process are rescheduled to be received by said plant during later time periods than specified during said first rescheduling process (see page 825, "Introduction", para. 3, disclosing rescheduling to produce later than a due date; page 826, sections 2.1 and 2.1.1, disclosing the latest delivery time required by an order; figure 1)”.

[0008] The Applicants respectfully disagree. As discussed above, in the present invention (e.g., see paragraphs [0134]-[0136]), a first rescheduling process is performed, which comprises rescheduling the purchase order receipts so as to indicate that they will be received by the plant at earlier dates than initially specified. Then, these rescheduled purchase orders and, more particularly, the rescheduled purchase orders associated with the earlier dates are used to solve the core production planning equations. Wang does not teach a process whereby the dates at which purchase order receipts are to be received at a plant are rescheduled prior to solving core production planning equations. Rather, Wang teaches that production planning equations are solved using a window of within in which delivery of the product to the customer can occur. This window being defined by an earliest delivery date and a latest delivery dates.

[0009] Specifically, per the Abstract, the Wang article focuses on production planning problems to minimize the total earliness and tardiness penalties with a due-window subject to the manufacturing resource constraints. Two models, one for mass manufacture and another for one-of-a-kind product (OKP) manufacture are disclosed. The model for mass manufacture translated into a linear programming problem and solved by a simplex method. The model for OKP manufacture is reduced to a linear 0-1 programming model, using elaborate definition variables.

[0010] On page 825, paragraph 3 of the introduction refers to a planning model in which customer orders are produced with references to an exact due-date that is either earlier or later (tardier) than the due time specified by the customer. That is, it refers to an earliness/tardiness planning model with an exact due-date). Paragraph 4 of the introduction indicates that the paper

of Wang extends this earliness/tardiness planning model with an exact due-date to an earliness/tardiness planning model with a due-window.

[0011] On page 826, section 2.1 describes a different problems related to early production and to late production of a customer product. Thus, the paper of Wang proposes a earlier/tardier planning model with a due-window vice an exact due-date in order to find an optimal production planning horizon to minimize the total cost of earliness/tardiness penalties. Section 2.2 provides notations/formulas that are solved during production planning using this model and section 2.1.1 defines the variables in these formulas. Specifically, section 2.1.1 indicates that both the earliest delivery time required by the order  $k$  and the latest delivery time required by the order  $k$  are considered.

[0012] Page 827 illustrates formulas to figure the production quantity of a product  $i$  without earliness penalties and without tardiness penalties. Figure 1 shows graphs illustrating the relationship between due-windows and free regions, the wider the due-window the larger the free region.

[0013] Beginning on page 833 the paper of Wang begins describing the OKP manufacture planning model. Section 3.1 defines problems associated with OKP manufacture and indicates that the goal in OKP manufacture planning is to minimize the total earliness and tardiness penalties with a due-window and subject to the constraints and limited manufacturing capacity. Section 3.2 provides notations/formulas that are solved during production planning using this model and section 3.1.1 defines the variables in these formulas. Specifically, the earliest starting time of product  $i$ , the earliest delivery time required by the order  $i$  and the latest delivery time required by the order  $i$  are considered. Equation 29 indicates the earliest starting

time of products.

[0014] Thus, the Applicants submit that Wang discloses two different planning models (i.e., a mass manufacture planning model and OKP planning mode), wherein planning equations are solved based on various dates. However, Wang does not disclose performing, prior to solving such equations, the claimed first rescheduling process (which necessarily infers an initial scheduling process), which comprises “rescheduling when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant during earlier time periods than initially specified”. It further does not teach performing, after solving such equations, the claimed second rescheduling process, which comprises “rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during later time periods than specified during said first rescheduling process”.

[0015] Furthermore, while the paper of Wang refers to planning equation are solved based on various dates. None of these dates is a date on which a purchase order is to be received by a plant. Specifically, the mass manufacture planning model of Wang only considers a window of customer delivery dates. The OKP manufacture model of Wang only considers the earliest start date and the window of customer delivery dates. Thus, the solving process of Wang is not performed as claimed “using rescheduled purchase order receipts associated with said earlier time periods from said first rescheduling process.”

[0016] Therefore, the Applicants submit that amended independent claims 1, 8 and 21 are patentable over Wang. Further, dependent claims 2-4, 7, 9, 14, 16, 20, 22 and 26 are similarly

patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define. Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

B. Rejection Of Claims 5-6, 10-12, 14-15, 17-19, 23-25 And 27 Based On Wang And Lilly

[0017] The Applicants submit that the prior art references do not teach or suggest the following limitations of amended independent claim 15: (1) “performing, by said computer, a first rescheduling process comprising rescheduling when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant during the earliest time periods allowable by a supplier”; (2) “after said performing of said first rescheduling process, solving core production planning system equations using rescheduled purchase order receipts associated with said earliest time periods allowable by said supplier from said first rescheduling process”; and (3) “after said solving, sorting said rescheduled purchase order receipts from said first rescheduling process according to rescheduling flexibility and, based on said sorting, performing, by said computer, a second rescheduling process comprising rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during the latest time periods allowable by said supplier”.

[0018] In rejecting claim 15, the Office Action applies the same rationale as used in the

rejection of independent claims 1 and 8, based on Wang alone. Thus, for the same reasons as set out above with regard to the rejection of independent claims 1 and 8, the Applicants submit that the above-listed limitations of claim 15 are not disclosed by Wang.

[0019] Additionally, the Office Action acknowledges that Wang does not disclose the claimed limitations in dependent claims 5-6, 10-12, 14, 17-19, 23-25 and 27. Thus, the Office Action cites Lilly and/or takes official notices of these limitations. The Applicants respectfully disagree. Furthermore, for the reasons set out in the Amendment previously filed under 37 C.F.R. §1.111 on October 16, 2008, the Applicants further submit that Lilly does not teach or disclose any of the distinguishing limitations of the independent claims, as discussed in detail above.

[0020] Therefore, the Applicants submit that amended independent claim 15 is patentable over Wang, Lilly And the official notice taken by the Examiner. Further, dependent claims 5-6, 10-12, 14, 17-19, 23-25 and 27 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define. Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

#### **IV. Formal Matters and Conclusion**

With respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, Applicants submit that claims 1-27, all the claims presently pending in the application, are patentably distinct from the prior art of record

and are in condition for allowance. Therefore, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims and further to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

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